

THE WARHEADS AND ENERGETICS TECHNOLOGY CENTER

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Introduction

The U.S. Army Tank-automotive and Armaments Command's Armament Research, Development and Engineering Center (TACOM-ARDEC) at Picatinny Arsenal, NJ, is the Army's focal point for ammunition and ammunition-related technologies. Today, this responsibility is more difficult than ever because of reduced spending, consolidation, and downsizing of government and industry. For example, the ammunition procurement appropriation is down 78 percent from the 1986 peak, and the number of ARDEC engineers and scientists has declined 21 percent with another 37 percent reduction planned for 2003. Sixty percent of current engineers and scientists could retire by 2004. The labor shortfall caused by the booming U.S. economy, as well as competition with the commercial technology sector, makes retention of key engineers a serious problem. Additionally, industry-independent research and development (R&D) funds, largely generated by production dollars, are greatly diminished.

The Plan

To deal with this adverse business environment, many government organizations have tried to develop long-term partnerships with industry. Traditionally, these relationships have taken the form of Federally Funded R&D Centers, University-Affiliated Research Centers, Centers of Excellence, or Cooperative R&D Agreements. However, these part-

nership arrangements are inadequate to meet the challenges of technology management in the current business environment of the munitions industry.

Because of its unique mission, TACOM-ARDEC is developing a new type of partnership with academia and industry to overcome the adverse business environment. Specifically, TACOM-ARDEC and the Army Research Laboratory (ARL) are partnering through use of a concept called an Industry, Academia, Affiliated, Research Center, now commonly known as the Warheads and Energetics Technology Center (WETC). An industry/academia consortium is an integral part of WETC. By using WETC capabilities, TACOM-ARDEC can focus all available resources on the technical challenges that the Army faces in warhead and energetics science and engineering. Other centers and consortia are planned in various key munition technologies.

The purpose of WETC is to provide a means to develop, maintain, and archive corporate knowledge and to facilitate technical expertise for the future. The center's major goal is to improve U.S. industry, government, and university abilities to sustain military supremacy in warhead and energetics research, development, engineering, and production.

TACOM-ARDEC and ARL must determine how to leverage available resources to their maximum potential in this environment of limited personnel and resources. To do this, several key ques-

tions must be answered. For example, in the area of warheads and energetics, where the expertise is gained through many years of on-the-job experience, how does the Army maintain experiential continuity? How will corporate knowledge be maintained? How will energetics and warheads be developed in the future, and how will the government define its role in the future of this technology? How will funding be maintained in the technology base? Finally, what is the future of the industrial base in a shrinking procurement environment?

Vision, Objectives, And Goals

WETC will integrate academia, industry, and the government into a single enterprise that will execute separate industry and government-funded projects and co-funded initiatives. It will jointly develop goals and objectives and share resources and assets. Cooperating with TACOM-ARDEC and ARL, the center will oversee warhead and energetics research, development, and engineering activities that address the Army's long-range goals. These goals will be consistent with the Army's Warheads and Energetics Strategic Master Plan.

Consortium members will team with other industries, universities, and government members for their mutual benefit. The government and consortium will enter into a long-term nontraditional partnership. This new partnership will give the consortium's industry and academia members opportunities for greater participation in the long-range planning of government research programs. One of the center's objectives is to develop a focused, goal-oriented, technology-driven program that is technically and program-matically sound.

WETC will develop and maintain a master plan that defines performance goals and maximizes the team's capabilities. With industry and academia included in the planning process, complete "buy-in" to overall plans should be achieved that will assist in executing a flexible multiyear integrated R&D plan. This new arrangement will provide a single team focused on aggressively addressing short- and long-term technical and programmatic objectives. Further, the arrangement will provide more efficient

use of capital and will encourage employee exchange to facilitate cross training and multiple expertise development.

The collaboration and collocation of technologists, systems integrators, producers, and customers will provide customer participation from the earliest stage of development. This will result in streamlined development and transition, close adherence to customers' system requirements, and high potential for horizontal technology insertion to other applications. In short, this collaboration will effectively and efficiently develop and transfer critical technology to the warfighter to maintain a decisive lethality overmatch.

How It Will Work

The government's role will involve directly participating in these collaborative efforts, providing funding, and sharing expertise and facilities. Non-government collaborators will share costs in warhead and energetics technology development and contribute their own resources, including personnel, materials, facilities, equipment, and instrumentation. These actions will be accomplished through other transaction (OT) agreements with the consortium, wherein members participate through articles of collaboration that define their purpose, goals, and responsibilities. These responsibilities include how the members will safeguard and share intellectual property.

Use of OT agreements and pre-agreed-upon articles of collaboration, especially regarding intellectual property, will greatly streamline the acquisition process. The basic structure of the National Rotocraft Technology Center and American Automobile Association are two examples of how WETC could ultimately be organized, with some specific variations attributable to the nature of the ammunition business. The government must still establish priorities and track progress to ensure deliverable dates are met.

The consortium will consist of industry (large and small businesses), universities, and nonprofit organizations working with TACOM-ARDEC and ARL personnel and their laboratories and facilities when necessary. Government funding

estimates range from \$3 to \$4 million annually. The term of the agreement is expected to be at least 5 years.

As the WETC and the consortium develop, the other Services (Navy and Air Force) might join in the TACOM-ARDEC/ARL partnership. If this happens, it is anticipated that the Office of the Secretary of Defense and other key organizations would serve on the various committees in the center.

Comments from industry and academia during two Industry Days hosted by both ARDEC and ARL resulted in the following concerns being expressed.

- Tasks involving management of the consortium and any required dues should be kept to a minimum to encourage the highest amount of participation.

- Profitability must be a motivating factor for industry to remain in the consortium, especially if it is to provide cost-shared funds and show a reasonable return on investment with military technology that usually has minimal commercial application. To accomplish this, a much clearer link to transition and production must be established for all the technologies.

- The Army's role as a user advocate and an honest broker of industry must be maintained; i.e., it must support the Army's "smart buyer" capability.

- The competitive process should not be undermined.

The procurement process will be greatly simplified by using OT agreements to establish contracts with consortium members. Currently, about 45 members of academia and industry have expressed interest in joining the consortium.

Benefits

Although the WETC structure continues to evolve, we expect that this center will result in a unique world-class partnership among the government, academia, and industry for warhead and energetics research and development.

Other key benefits and payoffs include the following:

- An Army strategic plan for energetics and warheads that clearly defines the objectives, goals, and payoffs in terms that Congress and DOD can understand;

- A fully coordinated requirements definition and research, development, test, and evaluation activities;

- Time-phased and measurable programs;

- Reduced duplication of effort;

- A proactive role for industry and academia in R&D planning;

- Increased industry investment;

- Shorter procurement timelines;

- Focused resources;

- Full partnering;

- Development and retention of critical skills;

- Acceleration of technology transition to weapon systems; and

- Continued U.S. battlefield superiority.

Conclusion

The viability of providing world-leading energetics and warhead technology to future munitions developers will be sustained by constantly focusing and fully leveraging all resources. This will provide today's warfighters with world-class munitions and enable future warfighters to maintain a decisive lethality overmatch. Further information can be found at the Warhead and Energetics Technology Center Web site at <http://w3.pica.army.mil/wetc> or by contacting Ray Pawlicki at (973) 724-3386, Dr. David Downs at (973) 724-3016, or Albert Horst at (410) 306-0601.

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